BIOS

Alberta Society of Professional Biologists • Spring 2005 Volume 20 • Number 1

Millennium Ecosystem Assessment

The **Millennium Ecosystem Assessment Synthesis Report** is the first in a series of seven synthesis and summary reports and four technical volumes that assess the state of global ecosystems and their impact on human well-being. This report was released together with a statement by the Millenium Assessment board of directors entitled "Living beyond Our Means: Natural Assets and Human Well-being."

This landmark study, reveals that approximately 60 per cent of the ecosystem services that support life on Earth - such as fresh water, capture fisheries, air and water regulation, and the regulation of regional climate, natural hazards and pests - are being degraded or used unsustainably. Scientists warn that the harmful consequences of this degradation could grow significantly worse in the next 50 years.

> " Humans have changed ecosystems more rapidly and extensively in the last 50 years than in any other period."

The four-year assessment was designed by a partnership of UN agencies, international scientific organizations, and development agencies, with guidance from the private sector and civil society groups. Major funding is provided by the Global Environment Facility, the United Nations Foundation, the David and Lucile Packard Foundation, and The World Bank. The Millenium Assessment Secretariat is coordinated by the United Nations Environment Programme (UNEP).

The work of the MA was conducted through four working groups, each of which prepared a report of its findings. The Condition and Trends Working Group assessed the state of knowledge on ecosystems, drivers of ecosystem change, ecosystem services, and associated human well-being around 2000. The Scenerios Working Group developed four scenerios for possible evolution of ecosystem services this century. The Responses Working Group examined the strengths and weaknesses of various response options to manage ecosystem services and opportunities for improving human well-being. The Sub-global Assessments Working Group contains lessons learned from the MA sub-global assessments. While the MA Synthesis provides a highly readable overview, additional details are provided in full technical reports of the four MA Working Groups which will be published in mid-2005 by Island Press.

Conducted by 1,300 experts from 95 countries, the study specifically states that the ongoing degradation of ecosystem services is a road block to the Millennium Development Goals agreed to by the world leaders at the United Nations in 2000. Any progress achieved in

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BIOS is written for the enjoyment of the members of the Alberta Society of Professional Biologists and those interested in the field of professional biology. Articles or comments are welcomed and should be communicated to the ASPB Office. Editing and layout by Gavin More.

WELCOME NEW MEMBERS

Regular: Brian Aitken, Gregory Allen, Janet Bauman, James Berdula, Lisa Bridges, Nadia Contant, Marie Decker, Eric Hartman, Thorsten Hebben, Kristine Mason, Michael Maximchuk, Alexander McClay, Laura McCreanor, Carol Stefan, Christopher Teichreb, Eliot Terry

Biologist In Training: Charles Brassard, Michael Bartlett, Natalie De Roche, Joel Gowman, Lydia Hollis, Laura Holmes, Corinne Johnson, Lisa Lowther, Erin Rooney, Marie Schlachter, Colleen Simpson, Shaun Toner

Student: Michael May, Karl Zimmer

Membership Update

ASPB membership as of May 1, 2005: **Total 532**

Regular	447	Biologist in Training	56
Honorary	7	Temporary Withdrawn	11
Student	5	Public Member	1
Associated	5		

ASPB Elections

At the April 28, 2005 ASPB Annual General Meeting the following 2005/2006 Board of Directors were announced.

Robert Dallas ~ President
Bob Holland ~ President-Elect
Carol Engstrom ~ Secretary
Gary Ash ~ Treasurer
Corey De la Mare ~ Director
Maureen Hill ~ Director
Garry Hornbeck ~ Director
Steve Morck ~ Director
Ricardo Moreno ~ Director
Troy Whidden ~ Director
Stu Ross ~ Public Member

Please welcome Maureen Hill, Corey De la Mare, and Troy Whidden as new members to the board. We would also like to thank outgoing Secretary
Maire Luoma, and Directors Christine Brown and Henry Epp for their dedication to the ASPB board. In addition, thank you to Teresa de Grosbois for her three year commitment to the Executive Council.

Robert Dallas
President

President's Message

The past year can be counted as one of the most interesting in ASPB history, with several significant developments taking place. One issue that occupied a considerable amount of the Board's resources was the specialist sign-off of reclamation and remediation programs in Alberta. At the beginning of 2004, ASPB members were threatened with the possibility of being excluded from having the authority to sign-off on these programs. As 2005 comes to a close, ASPB members see themselves as having the same status as professional engineers, professional agrologists and professional foresters in being able to sign-off on these programs.

Much remains to be done, however, and we are working with the Contaminated Sites Advisory Committee and the Oil and Gas Reclamation and Remediation Advisory Committee to address outstanding issues. Chief among these issues are: the equitable apportionment of liability, defining skill sets for qualified practitioners, inclusion of practicing technicians into professional organizations. This last issue arose from Alberta Environment and Alberta Human Resources and Employments' recognized need not to exclude qualified persons who do not currently belong to a professional organization and thereby put them at an economic disadvantage. The upshot is that the ASPB will eventually have to accommodate the inclusion of technical school graduates into the society. The exact mechanism of how this will be accomplished is yet to be determined, but it will be tied into pending changes to the legislation governing our society (i.e. POARA - The Alberta Professional and Occupational Associations Registration Act). Suffice it to say this issue will keep the Board busy for some time to come.

Our most important initiative is the establishment of the beginnings of a Professional Competence Assurance and Development Program. One of our obligations as a Professional Society is to insure the continued professional competence of our membership and it was a key point in our argument to Alberta Environment that allowed us to gain the ability to sign-off of reclamation and remediation programs. In order for us to be able to make this claim we need a formalized documented system that is auditable.

Another aspect of professional development is the establishment of a mentoring program for Biologists in Training (B.I.T.). The aim of this program is to link experienced P.Biol. to the portion of membership who are Biologists in Training in a mentoring capacity and also serve as a reference for the BIT when they apply for full P.Biol. status. To date the program has received less than enthusiastic support from the membership and in 2005 we will be re-launching the program.

The one last initiative we are contemplating is the commissioning of a ring denoting the professional status of P.Biol. In the near future, we will be approaching the you for your views and feed back on whether or not you wish us to pursue this and if so on the design of the ring.

Robert Dallas P. Biol.

New At ASPB

Continuing Professional Development Program (CPDP)

It was recognized last year, with information that came from managers of the Professional & Occupational Associations Registration Act (POARA), that the members of ASPB would have to start accounting for their time and activities as biologists. In other words, are you as individual biologists maintaining a professional status through and by your activities? We compared the programs already established in APEGGA and ACPA. We borrowed from both, and added our own twists, producing a document that encompasses seven areas: 1) Professional Practice; 2) Formal Activity; 3) Informal Activity; 4) Participation; 5) Management; 6) Presentations; and 7) Contributions to Knowledge. Members will receive the CPDP document plus a fill-in form where credits can be claimed. There is also allowance for carryover credits for up to two years. The significance of the CPDP is that you will have to keep and maintain records of your activities as a Professional Biologist that are subject to independent verification. If we do not do this, our status as a professional society is on the line, and if we as individuals are found short, our renewal for registration as a professional is on the line.

ASPB Ring

The ASPB Board is considering a silver ring that can be made available for somewhere between $20 and $25. They will have ASPB deeply impressed in them, and there will be four (4) small stones embedded. Their colors will be deep blue (water); pale blue (sky); green (life and living things); and brown (soil). There will be two widths available - 5 mm and 4 mm.

Robin Leech
Executive Director

Bios Bits

More Birds Slipping Towards Extinction

BirdLife International's annual evaluation of how the world's bird species are faring shows that the total number considered to be threatened with extinction is now 1,212. Combined with the number of near threatened species, a total of exactly 2,000 species in trouble - more than a fifth of the planet's remaining 9,775 species.

The 179 are categorized as Critically Endangered. One of Europe's rarest songbirds, the Azores Bullfinch, has been in decline since the early 1990s and has fewer than 300 individuals left. Several European species appear on the list for the first time including: the European Roller, for which key populations in Turkey and European Russia have declined markedly; the Krüper's Nuthatch, a mainly Turkish species that has declined because of tourism development of its key habitats; and the Red Kite, which has suffered large declines across Europe, despite a highly successful reintroduction program in Britain.

Five species have been downlisted. The Kirtland's Warbler, a brightly-coloured songbird which breeds in Michigan and winters in the Bahamas, has been downlisted from Vulnerable to Near Threatened.

Proposed Species at Risk

The Minister of the Environment, in consultation with the Minister of Fisheries and Oceans, recently proposed to add 43 additional terrestrial and aquatic species to the list of species protected under the Species at Risk Act (SARA). Of 51 species assessed by COSEWIC at their meetings in November 2003 and May 2004, 44 species (animals, birds, aquatic species, reptiles and plants) were received by the Governor in Council in October 2004, thus starting the nine month listing process. The remaining seven species, all aquatics, are currently undergoing an extended period of consultation to better understand the potential impacts of listing these species.

The Minister of the Environment is recommending that the Plains Bison not be added to SARA at this time because of the inability to genetically distinguish wild and domestic Plains Bison and the potential economic implications for the Canadian Bison industry.

http://www.ec.gc.ca/press/2005/050516_m_e.htm

Canadian Atlas Online

The first interactive, web-based, fully bilingual atlas of Canada was launched in April by The Royal Canadian Geographical Society and Canadian Geographic magazine. The Canadian Atlas Online surpasses traditional print atlases using the latest interactive technologies to bring to life amazing maps and colourful presentations of Canada's geography, culture and people. The project was made possible through the support of the Government of Canada, TD Bank Financial Group and Microsoft Canada.

The maps contained on The Canadian Atlas Online, built on Microsoft server technology and development tools, exemplify cartographic excellence and allow users to zoom and pan, add and remove overlays, and interact with highly informative themed web pages to explore geographical details using easy, intuitive navigation.

The online atlas is focused on Canadian youth and the education sector. The atlas includes a wealth of interactive features that make learning about Canada's geography fun and enjoyable. Multi-level lesson plans are also included to enable educators to readily incorporate the many valuable benefits of the atlas into their school curriculums.

The Canadian Atlas Online includes themed modules that invite an in-depth exploration of topics ranging from weather to flora and fauna, as well as Canada's diverse people and its unique history. These module's feature rich media including video and animated graphics. To access The Canadian Atlas Online, go to www.canadiangeographic.ca/atlas.

Alberta's State of the Environment

Alberta's SoE reporting indicators are monitored over time to detect trends and identify environmental issues. The indicators and other information are organized around the main topics of Air, Water, Land, Biodiversity, Waste and Climate. The indicators track environmental conditions, measure environmental pressures, and show what is being done about these conditions and pressures. Progress towards desired environmental goals or outcomes is also described.

Links to overviews of each topic, maps and graphs of environmental trends with descriptions of each indicator, and what actions are being taken, technical reports, environmental data and websites are provided at http:\\www3.gov.ab.ca/env/soe/index.html

NA's Bird Nursery

This new research demonstrates that the Boreal Forest Region is vital to the abundance of bird life in the U.S. and Canada, and also contributes in a significant way to the abundance of birds in Mexico, the Caribbean, and Central and South America.

The findings show that the Boreal Forest Region is critical to the well-being of many species of familiar waterfowl, shorebirds, waterbirds and landbirds found in the U.S. and Canada. Nearly half of all North American birds (325 species) rely on the Boreal Forest Region. Over 300 of those species regularly breed in the Boreal Forest Region.

Key findings include:

- 80% of the waterfowl species of North America, 63% of finch species, and 53% of warbler species breed in the Boreal Forest Region;
- In at least 96 species, 50% or more of their entire breeding populations occur within the Boreal Forest Region;
- ~ 100% of the global populations of the treenesting Bonaparte's Gull, the bog-inhabiting Palm Warbler, and the elusive Short-billed Dowitcher nest within the Boreal Forest Region; and
- > 80% of the populations of the coastal wintering White-winged Scoter, the rapidly disappearing Rusty Blackbird, and the massive Great Gray Owl nest in the Boreal Forest Region.

The vastness of the Boreal Forest Region makes it one of the few remaining places on earth where entire ecosystems function. These ecosystems support some of the greatest abundance of wildlife on the continent, intact predator-prey systems with healthy populations of top predators like wolves and large numbers of birds. The Boreal Forest Region represents 26% of the land area of the U.S. and Canada and supports nearly 50% of North America's bird species.

The research employed scientific modeling techniques that combine Geographic Information System (GIS) mapping with broad scale bird abundance information. The procedure made it possible to attempt to fully quantify the importance of North America's Boreal Forest Region for all bird species including waterfowl, waterbirds, shorebirds and landbirds. Unlike most analyses of large ecoregions where the focus is primarily on threatened and rare species, this report examines the role of a large-scale ecosystem - the Boreal Forest Region - in maintaining the abundance of North American bird life.

http://www.bsc-eoc.org/borealnurseryrpt.html

ASPB Scholarships

It took over a year, but now students at the 'big three' universities - Alberta, Calgary and Lethbridge - are eligible to receive the ASPB's $2500 scholarship. The awards are for graduate students only in the field of biology. After due consideration, the University of Calgary recently expanded the possible recipients to include not only those in the Department of Biology, but also those in the Faculty of Environmental Design.

One scholarship was awarded to Alexandra Eaves. Alexandra has provided a letter of appreciation and a brief description of her research. This letter demonstrates how important the support of the ASPB is to students engaged in the study of biology.

I am very honoured to have been awarded the Alberta Society of Professional Biologists Graduate Scholarship at the University of Alberta. I am fortunate enough to be able to conduct the majority of my work at Bamfield Marine Sciences Centre, which is partly owned by the U of A in addition to the other major Western Canadian Universities. I study the rare phenomenon of asexual reproduction among arguably the most unusual looking animal larvae on the planet, those of sea urchins. I am primarily focused on the environmental conditions that induce sea urchin larval cloning, such as the abundance and quality of food, the presence of dissolved nutrients in seawater, and rudimentary exploration of the hormonal regulation of cloning. Fortunately (since my husband lives in Edmonton) I also conduct research at the U of A campus. I am doing a detailed histological comparison between the early development of clones versus 'regular' embryos, and characterizing expression patterns of signalling molecules important to early embryonic and larval development. I am indebted to the Society of Professional Biologists for its recognition of my efforts and am grateful for their support.

Sincerely,
Alexandra Eaves
Department of Biological Sciences
University of Alberta

Millennium Ecosystem Assessment continued

addressing the goals of poverty and hunger eradication, improved health, and environmental protection is unlikely to be sustained if most of the ecosystem services on which humanity relies continue to be degraded.

Although evidence remains incomplete, there is enough for the experts to warn that the ongoing degradation of 15 of the 24 ecosystem services examined is increasing the likelihood of potentially abrupt changes that will seriously affect human well-being. This includes the emergence of new diseases, sudden changes in water quality, creation of "dead zones" along the coasts, the collapse of fisheries, and shifts in regional climate.

The report highlights four main findings:

- Humans have changed ecosystems more rapidly and extensively in the last 50 years than in any other period. This was done largely to meet rapidly growing demands for food, fresh water, timber, fiber and fuel. More land was converted to agriculture since 1945 than in the 18th and 19th centuries combined. More than half of all the synthetic nitrogen fertilizers, first made in 1913, ever used on the planet has been used since 1985. Experts say that this resulted in a substantial and largely irreversible loss in diversity of life on Earth, with some 10 to 30 percent of the mammal, bird and amphibian species currently threatened with extinction.
- Ecosystem changes that have contributed substantial net gains in human well-being and economic development have been achieved at growing costs in the form of degradation of other services. Only four ecosystem services have been enhanced in the last 50 years: increases in crop, livestock and aquaculture production, and increased carbon sequestration for global climate regulation. Two services - capture fisheries and fresh water - are now well beyond levels that can sustain current, much less future, demands. Experts say that these problems will substantially diminish the benefits for future generations.
- The degradation of ecosystem services could grow significantly worse during the first half of this century. This will be a barrier to achieving the UN Millennium Development Goals. In all four of the plausible futures explored by the scientists, they project progress in eliminating hunger, but at far slower rates than needed to halve number of people suffering from hunger by 2015. Experts warn that changes in ecosystems such as deforestation influence the abundance of human pathogens such as malaria and cholera, as well as the risk of emergence of new diseases. Malaria, for example, accounts for 11 percent of the disease burden in Africa and had it been eliminated 35 years ago, the continent's gross domestic product would have increased by $100 billion.
- The challenge of reversing the degradation of ecosystems while meeting increasing demands can be met under some scenarios involving significant policy and institutional changes. However, these changes will be large and are not currently under way. The report mentions options that exist to conserve or enhance ecosystem services that reduce negative trade-offs or that will positively impact other services. Protection of natural forests, for example, not only conserves wildlife but also supplies fresh water and reduces

> "Ecosystem changes that have contributed substantial net gains in human well-being have been achieved at growing costs in the form of degradation of other services"

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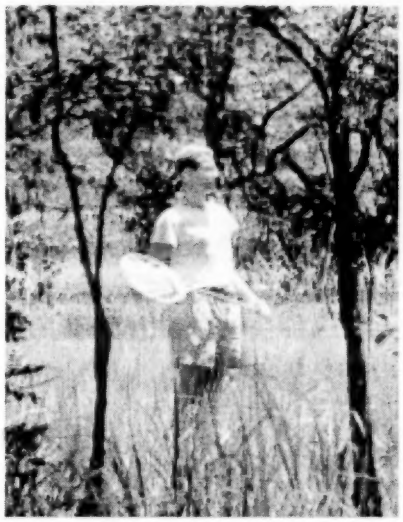
Access Management: Policy to Practice

The ASPB hosted a conference called "Prediction to Practice: Environmental Assessment Follow-up" on March 30-31, 2004 Attendees and presenters included representation from governments, the corporate sector, consultants, academics and non-governmental organizations, primarily from across Canada. The 239 page softcover Access Management: Policy to Practice Proceeding from the 2004 sympposium costs just $25 plus GST. To order contact the ASPB Office at 780-434-5765 or pbiol@aspb.ab.ca

Hunting Africa's Littlest Game

A few years ago, back in the mid-50s, I was on an expedition to Africa to collect insects, spiders, snakes, lizards, and any other small critter moving about. The expedition was sponsored by the California Academy of Sciences in San Francisco, and the National Geographic Society of Washington, DC.

After my second year at UBC, I went by train to San Francisco. The next two months were furious with activity as we prepared the vehicle in the large garages of the California Academy of Sciences, all our collecting supplies, plus 5000 feet of 16 mm motion picture film (Kodachrome 1, ISO 10) in 100 foot rolls, 1000 rolls of Kodachrome I, 35 mm, 36 exposure, film for our Exakta VX and VXIIa single-lens reflex cameras, and some 1000 rolls of 120 color and black and white film for a Hasselblad 6x6, single-lens reflex camera. The motion picture camera was an Arriflex, again a single-lens camera that permitted us to see exactly what pictures we were taking. The 35 mm and 6x6 cameras used powerful Heiland-Honeywell electronic flash units, which had a 510 volt battery to drive them. Back in the mid 1950s, there were only two brands of single-lens reflex cameras in 35 mm on the market.



A young Robin showing proper form for insect collecting in Africa.

The expedition was an acclaimed success. We collected over 250,000 insects and other critters, including representatives for all genera of reptiles known then in Africa south of the Equator. Even today, this record has not been surpassed. We used all the motion picture film, and had to request several hundred more rolls of 35 mm Kodachrome I film. We took over 2500 B&W pictures. The expedition was eventually featured in the National Geographic Magazine in March 1961 in an article titled, "Hunting Africa's Smallest Game" by Edward S. Ross, the expedition leader.

As any and all know, collecting insects and such is simple. Anyone can do it, right? Prance through the fields, swing the net through the air, turn over a rock, peel some bark off a dead tree, sweep a whole bunch off flowers, and so on. It's simple and easy, right? But, what about those larger butterflies capable of flying about 3 or more metres above the ground? How to you catch them? These butterflies have a wing span of 15 cm or more, and rarely come down to alight on flowers and leaves - except late in the day, and these are seen even more rarely. Hence there are so few in museum collections.

For the first few weeks, I stared in awe at these large butterflies, knowing that there was no way on Earth that I could catch even one of them. They are bigger than any we have in Canada. Then one day I had a flash inspiration - I'll shoot them with the gun I brought along. I discussed this first with Ed Ross. At first he listened to me with his jaw slack, but then said I could try for a few by this way - just to experiment, mind you. I think he thought that by allowing me to shoot a few shots it would get the gun obsession out of my mind. I think he had visions of me retrieving useless bits of butterfly wings.

So, next day I fired 3 shots and felled 3 large butterflies. I was in butterfly-collector's heaven. The butterflies were in perfect condition, even better perhaps than those collected by net, where occasional torn and broken wings occur, and severe rubbing in the net takes many scales off the wings.

I had been given part of an old Smith & Wesson .22 calibre pistol kit. The part I received was the action with the 30-cm-long target barrel. This gun had been used in Java in 1899 by a biologist for collecting small mammals and reptiles. He gave it to me more than 50 years later. The barrel had little rifling left, so it was perfect for shooting shot from those small .22 calibre, crimped-brass shotgun cartridges. The shot is smaller than # 12 shot - ground-pepper grains in size. Even when only one micro-size pellet hits the butterfly's thorax, the wings fold, and the butterfly drops to the ground. The specimens are undamaged for research and scientific work (morphology and taxonomy).

I apologize if I do not fit the mental image of the game hunter in Africa, or that of the classical butterfly collector dashing this way and that, swinging my net to and fro. It is time for you to expand your mental images to encompass a large guy with a small gun shooting large butterflies which are flying high and out of reach of nets. As the expression goes, "Learn how to use the tools you have, and you can do almost anything." After that, imagination and creativity take over.

Oh, and for the curious, the expedition leader let me use the gun thereafter whenever I felt the need for it. Even he was impressed. But, once outside the deep, tall forests of the then Belgian Congo, I had little need for it.

Robin Leech P. Biol.

Millennium Assessment concluded

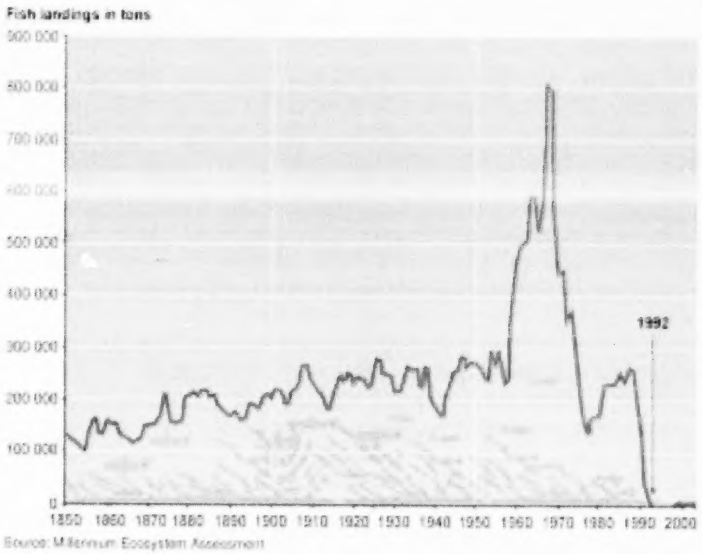
carbon emissions.

The Millenium Assessment also reveals that it is the world's poorest people who suffer most from ecosystem changes. The regions facing significant problems of ecosystem degradation - sub-Saharan Africa, Central Asia, some regions in Latin America, and parts of South and Southeast Asia - are also facing the greatest challenges in achieving the United Nations' Millennium Development Goals. In Sub-Saharan Africa, for example, the number of poor people is forecast to rise from 315 million in 1999 to 404 million by 2015.

The MA is recognized by governments as a mechanism to meet part of the assessment needs of four international environmental treaties - the UN Convention on Biological Diversity, the Ramsar Convention on Wetlands, the UN Convention to Combat Desertification, and the Convention on Migratory Species.

Five reports were prepared for use by these specific audiences. The synthesis reports currently available for downloading include:

Biodiversity and Human Well-being: A Synthesis Report for the Convention on Biological Diversity. This report provides an overview of biodiversity across the assessment, organized around a set of 6 questions posed by the CBD to the MA.



Global Assessment of Desertification: A Millennium Ecosystem Assessment Synthesis Report. This report integrates findings of the MA related to current state and future trends of desertification and its impacts on ecosystems and human well-being, and is organized around a set of key information needs identified by the CCD.

Three synthesis reports will be available for downloading in June including:

Wetlands and Water: Ecosystem Services and Human Well-being which was written as a guide for the Ramsar Convention on Wetlands parties, and contains the MA findings concerning inland, coastal, and near-shore marine wetlands.

Ecosystems and Human Health Synthesis Report. The World Health Organization will publish this report, examining the linkages between ecosystems and human health. It looks at how ecosystem change and various management decisions affect human health, and considers the role of ecosystems in achieving the Millennium Development Goals with a particular focus on health.

Ecosystems and Human Well-being: Opportunities and Challenges for Business and Industry. This report synthesizes the key messages of the MA and discusses the implications of MA findings for the business community.

To download all of the synthesis reports visit: http://www.millenniumassessment.org/en/Products.Synthesis.aspx

The MA website contains a link to the Island Press site for ordering technical reports of the working groups .